ALABAMA PRISON ARTS + EDUCATION PROJECT

THE WARBLER

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Dear Student, Artist, Thinker,

Did you know that **insects** are the most diverse group of animals on the planet? There are almost 1 million known species and we are only beginning to learn everything there is to know about these little creatures. A couple of interesting details about insects are that they generally have six legs and they most often begin their lives as eggs. Many times they start life as one bug and evolve to another one. Some have wings and some crawl on the ground. They live in trees, shrubs, dirt, manure, and even in glaciers. They have been around for generations and some are more appreciated than others.

This issue of *The Warbler* will show you how insects can be social and used to create art and how extremely beneficial they are to the survival of our planet. And whether you love bugs or not, we hope to leave you with a deeper appreciation of how amazing these tiny creatures can be and how we all depend on each other to make this world go round.

The APAEP Team

"In the path of compassion even if we can save an insect that has a huge impact on the cosmos." **AMIT RAY** // Indian author

WORDS INSIDE

WORD INSIDE "BUGGED OUT! ..."
entomologist | scientific study of insects

biomimicry | the design and production of materials, structures, and systems that are modeled on biological entities and processes

urbanization | the process of making an area more urban

WORDS INSIDE "WHAT IS THE IMPORTANCE OF INSECTS ...?
anthropogenic | caused or influenced by humans

volatilization | process where a dissolved sample is vaporized

taxa | group of one or more populations of an organism

WORDS INSIDE "WHAT ARE SOCIAL INSECTS?"
thermoregulation | process that allows your body to maintain its core internal temperature

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ART

Bugged Out! Exhibit Displays Insect Diversity and Importance

BY KRISHNA RAMANUJAN | *Cornell University* | March 28, 2022

Insects are by far the most diverse group of animals on the planet, with more than 1 million estimated known species, and many millions more that have yet to be named. A 2018 study estimates there could be as many as 14 million total insect species.

An exhibit at the Paleontological Research Institution's (PRI) Museum of the Earth in Ithaca – created in collaboration with Cornell entomologists and displaying approximately 1,000 specimens from the world-renowned Cornell University Insect Collection (CUIC) — offers a fascinating education in the diversity of insects and their importance to life on Earth.

A visit to the exhibit, "Six-Legged Science: Unlocking the Secrets of the Insect World," which opened March 28 and will continue through the end of the year, provides visitors with a small slice of CUIC's research collection of 7 million specimens and 200,000 species.

Displays offer examples of biomimicry, an evolutionary trick to conceal a bug's true identity, including flies, beetles and moths that to an untrained eye appear indistinguishable from bees, or butterflies that look exactly like leaves, or beetles that resemble ... feces.

There are giant insects such as the white witch moth, with a wingspan of up to 12 inches, and the Goliath beetle, which is more than 4 inches long.

One panel reveals a breadth of moth and butterfly species from New York state, which boasts 3,000 confirmed species, though there are likely 1,000 more yet to be identified.

"I think that [some] people tend to think of the five most commonly encountered insects and think that represents everything, and it's so far from the truth," said Corrie Moreau, CUIC director and the Martha N. and John C. Moser Professor of Arthropod Biosystematics and Biodiversity. Moreau designed the exhibit with Jason Dombroskie, CUIC manager and coordinator of the Insect Diagnostic Lab, and Helaina Blume, PRI's director of exhibitions.

Despite all this diversity, insects are declining at astonishing rates, with entomologists warning of an insect apocalypse.

As one panel states, some entomologists have estimated that we're losing about 10 to 20% of all insects every decade, due to habitat loss, pesticides, invasive species, urbanization, pollution and climate change. "Insect declines are due to a death by a thousand cuts," Moreau said.

The exhibit highlights the importance of insects to people and life on earth, in both positive and negative ways. While some insects spread disease and damage crops and infrastructure, others provide invaluable ecological and agricultural services, including pollination and food sources to animals (and people in many parts of the world).

"I'd want this exhibit to reduce the number of people that pass by an insect and say, 'that's just a bug'," Dombroskie said. "I'd want them to be able to associate a story to that, to see how important that insect is."

As a takeaway, the exhibit offers ways that individuals can help, including educating themselves about insects; shrinking their lawns, which provide poor habitat; using more native plants when landscaping; limiting pesticide use; turning off unnecessary outdoor lights that adversely affect nocturnal insects; and fighting climate change. "We're hoping visitors walk away knowing that they can do something in their own backyards to help insects in decline," Blume said.

Six insect displays from the exhibit arranged by color highlight insect beauty and diversity

The wide array of panels and displays include: evolutionary history; fossils; descriptions of the CUIC, its importance to research, and information on the insect diagnostic lab where specimens are identified; a glimpse into insect research; anatomy and life cycles; a section on relationships between insects and society; and insects and climate change. ●

SUSTAINABILITY

Composting with "Bugs"

FROM SUSTAINABILITY IN PRISONS PROJECT

The composting program housed by the Washington State Reformatory Unit (WSRU) at Monroe Correctional Complex is like none other. The program was founded in 2010 by two men incarcerated in the unit. Nine years later, the program has grown enormously and partners with multiple non-profits and schools. The program is internationally recognized as a model and is still led and operated by technicians who are incarcerated and teaching assistants.

The program currently processes 20,000 lbs. of food waste every month. To transform waste into valuable resources, technicians work with three kinds of "bugs":

Worms (also known as red wigglers and the "vermi" in *vermicomposting*): Worms consume discarded grains, vegetables, and fruits. Their droppings are called *castings*, and worm castings are highly prized as fertilizer and soil amendment.

Bokashi: Specialist bacteria can ferment/pre-process citrus, dairy, and meats that the worms cannot.

Black soldier flies: Larvae of a stingless wasp (looks like a fly) can consume all kinds of food waste; they turn it into more larvae that are prized as high-quality animal feed.

These approaches to composting represent relatively new technologies. Building on earlier studies, the WSRU program has developed, tested, and improved methods. Their current focus is multiple small-batch trials with black soldier flies — cutting edge research that stands to change how we deal with human food waste and feed domestic and ocean food stocks.

Partnerships and Wider Impacts

From the beginning, members of WSRU's staff have supported and championed the program. The program has provided starter kits for other residential facilities, including the sizable worm farm in Washington State Penitentiary's Sustainable Practices Lab (SPL). The program worked with Seattle's Tilth Alliance and SPP partners at Evergreen to create formal education and certification for technicians and they have graduated two classes so far. In 2018 and '19, graduate students from University of Washington (UW) visited the program to conduct research on soil amendments' effects on vegetable growing; compost technicians advised on and supported those studies. In addition, University Beyond Bars staff offer vital program support and connection to other educational efforts at the prison.

Scientists, corrections specialists, professors, students, and entrepreneurs have visited and toured the facility. Technicians created a virtual tour for the International Conference on Sustainability in 2019.

The composting program is co-located with WSRU's SPL where technicians create toys and crafts from scrap wood donated by Canyon Creek Cabinet Company, rebuild wheelchairs for Wheels for the World and bicycles for local non-profits. The SPL donates all items. A Roots of Success classroom is also in the SPL, allowing ideas to be shared amongst instructors, students, and technicians.

Origin Story

In 2010, friends Nick and Rory took on the challenge of composting food waste with worms. Starting with a literal handful of worms and the gumption to figure it out, they built the first bins from whatever materials they could find: laundry baskets and buckets. They were lucky to have strong support from staff members; it's critical to have staff allies who can help bring in resources and talk to other staff about making sure new activities don't get in the way of essential operations or policy.

A lead technician describes worm composting for program visitors.

Photo by Sadie Gilliom

Nick and Rory learned how to grow the number of worms in breeding bins, a process called *vermiculture*. They also learned how and began to refine composting with worms, known as *vermicomposting*. Fairly quickly, they realized they could process food waste year-round, with almost no odor. They were sold!

2014 was a year of big changes. Rory moved to another facility, another officer took over supervision, and Evergreen staff began to play a bigger role. Nick presented at Turning Keys TEDx, and his representation of the program and the SPP model was remarkable. At the same time, technicians built new composting bins–these ones made of reclaimed mattress parts–and began trials with Bokashi.

Program evolution has continued at a fairly rapid pace. In 2015, they established the partnership with Tilth Alliance, and together with SPP-Evergreen developed formal education and certification. Also they started working with black soldier flies.

The first fly shack has grown into a state-of-the-art testing facility. The program is championed by officers within the facility. Nick works as a Teaching Assistant for University Beyond Bars. Lead technicians Juan and Rudy mentor the next generation of program leaders. And as Nick says, they are eager "to see what the next great bug" of their future will be. ●

Edited for space

MATHEMATICS

Sudoku

#221 PUZZLE NO. 4761807

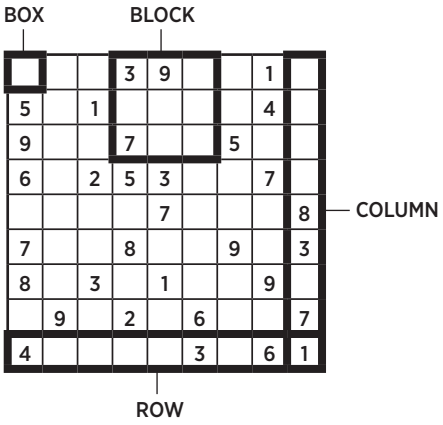
			8		9			
	1	2				4	5	
5								
	4	1						
	5		2					
3				4	6			
						5		3
8	7				5		6	
				3	7	2		

#222 PUZZLE NO. 6706583

2						9		
					3			
				1	9			
9					2			6
		8	4					7
1								9
3			1	7	6			5
				5		8		
	7						2	

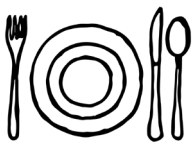
SUDOKU HOW-TO GUIDE

1. Each block, row, and column must contain the numbers 1–9.
2. Sudoku is a game of logic and reasoning, so you should not need to guess.
3. Don't repeat numbers within each block, row, or column.
4. Use the process of elimination to figure out the correct placement of numbers in each box.
5. The answers appear on the last page of this newsletter.



What the example will look like solved

2	4	8	3	9	5	7	1	6
5	7	1	6	2	8	3	4	9
9	3	6	7	4	1	5	8	2
6	8	2	5	3	9	1	7	4
3	5	9	1	7	4	6	2	8
7	1	4	8	6	2	9	5	3
8	6	3	4	1	7	2	9	5
1	9	5	2	8	6	4	3	7
4	2	7	9	5	3	8	6	1



"There's no insects in American cuisine? Not one? I don't think there are. That's so sad."

MARCELA VALLADOLID // American chef and author

Icons from the Noun Project

DID YOU KNOW?

Fruit flies were the first living creatures to be **sent into space.**

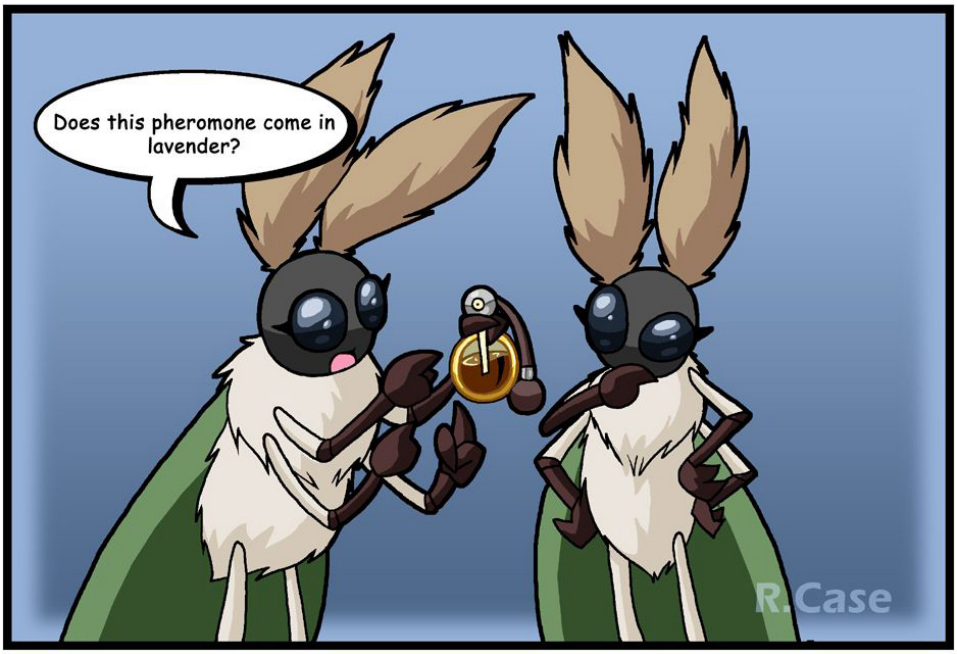
Dragon flies have been on Earth for **300 million years**.

A **bee's wings** beat 190 times per second or 11,400 times per minute.

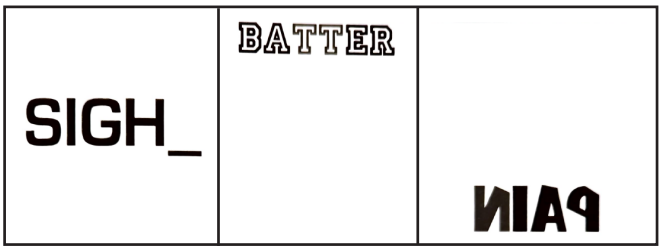
One dung beetle can drag **1,141 times its weight** — equivalent to a human pulling six double decker buses.

Large groups of fireflies sometimes **flash in unison**.

Source: www.natgeokids.com/uk/



THE FEMALE LUNA MOTH LURES A MALE BY GIVING OFF A PHEROMONE THAT THE MALE SENSES WITH HIS FUZZY ANTENNA.



WORD PLAY A Rebus puzzle is a picture representation of a common word or phrase. How the letters/images appear within each box will give you clues to the answer! For example, if you saw the letters "LOOK ULEAP," you could guess that the phrase is "Look before you leap." *Answers are on the last page!*

Idiom

"Put a bug in someone's ear"

Meaning To speak to one in order to impart some particular information, suggestion, hint, or warning; Give someone a hint about something, as in *Janet put a bug in her partner's ear about getting the children a dog.* This idiom presumably likens the buzzing about of an insect to a hint, although the exact analogy is not clear.

Origin c. 1900

Source: https://idioms.thefreedictionary.com

GRASSHOPPERS EXISTED **BEFORE DINOSAURS**.

GRASSHOPPERS HAVE SPECIAL ORGANS IN THEIR HIND LEGS THAT **STORE ENERGY** FOR JUMPING.

"When a dangerous insect perches on a delicate body part, even a quick tempered man quickly learns how to settle provocative issues amicably."

VINCENT OKAY NWACHUKWU // African filmmaker

ART + CULTURE

Scavenging Achievers

BY SUKARMA RANI THERAJA

I was asleep
when a copper-coloured beetle touched my feet.

Strongest insect that fondly eats
our planet's daily waste.
Rolling, digging and tunnelling dung,
it sings songs of life with balls of dung.
Forwards and backwards into balls,

Rolling, rolling spheres of manure,
picking-up seeds at every turn.
Moving, dispersing and fertilizing
seeds on-the-move by rolled dung balls.

Digging, digging to bury those balls.
A store of moisture, a harvest of food.
A safe abode and nursery,
brooding babies, all-in-a-ball.

Tunnelling, tunnelling, spreading that dung,
repeatedly changing the texture of soil.
Porosity, quality, germination
all get better where dung beetles dwell.

Egyptians and Adivasi knew
the values of these scarab saviours.
So keep these achievers in the loop,
revere those scavenging beetle troops,
cleaning up our planet's poops.

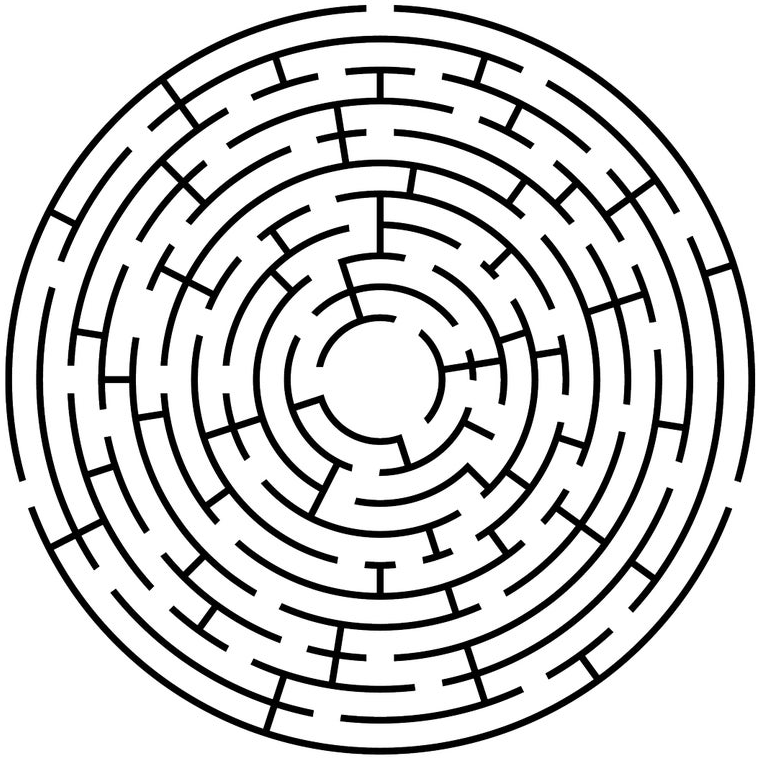
Dr. Sukarma Rani Thareja is an Associate Professor of chemistry at CSJM Kanpur University in Kanpur, UP, India. In order to create personal and creative interests in students, she engages them in summarizing lectures after finishing a chapter in their own words and their own ways. She composes small poems and gives students the opportunity to combine chemistry information with their own personal reactions.

WRITING PROMPT

In Dr. Sukarma Rani Thareja's poem, she writes how the dung beetle works tirelessly to clean up the planets "poop." This poem reflects on the role of insects in our world and how we may not even notice they are there, but they impact our lives and livelihood so greatly. Many times, insects are not acknowledged because the idea of "out of sight out of mind". For this writing prompt, think about what it would be like to be a bug for a day. Pick your favorite insect and use this as inspiration to write a short story, poem, or non-fiction essay about what a day in the life of this insect would be like.

Maze Puzzle

THIS MAZE HAS THREE SOLUTIONS. CAN YOU SOLVE THEM ALL?



Jessica Boddy | Popsci.com | Published Aug 19, 2020

FEATURE

What is the Importance of Insects in the Ecosystem?

BY BENJAMIN ELISHA SAWE | *WorldAtlas* | December 8, 2019

The ecosystem can be defined as the complex of organisms, their environment, and their interrelationships in a given geographical area. Natural ecosystems provide invaluable services to humans and other organisms that are essential for their survival and well-being. Services provided by the ecosystem can include the provision of food, water, fiber, and other resources, while non-material benefits of the ecosystem can consist of recreation and aesthetic value. The ecosystem also supports pollination, primary production, decomposition, and soil formation, which is essential for resource production. Other vital aspects of the ecosystem include biological control and feedback mechanisms that ensure consistent delivery of services. While provided at no cost, the value of ecosystem services across the world is estimated at 33 trillion US dollars annually. Ecosystems are also responsible for several "disservices" such as litter, pests, diseases, poisonous and allergenic organisms, animal attacks, and geophysical hazards like floods. Many of the disservices listed are, however, exacerbated by increased anthropogenic destabilization of ecosystem structures, food webs, and processes responsible for the mitigation of events such as storms, floods, and other weather systems.

Pollination of Plants

Insects are responsible for the pollination of about 80% of trees and bushes on the entire planet. Plants invest significant amounts of energy in the formation of attractive blooms full of nectar. Such features are produced primarily to attract insects that act as the chief agents of pollination for most of them. Some of the plant species that have developed such features include Maple, Cherry, Hawthorne, Buckthorn, Lime, and Rowan Berry. The relationship between plants and insects is very complex. Orchids, for example, have co-evolved with insects over millions of years and can only be pollinated by a single species of insect. Bees are some of the most important pollinators in the ecosystem. Insects such as bees usually pick up pollen in "baskets" formed by hairs on their abdomens or legs. Without bees, most of the plants we rely on would not be able to produce most of the food we eat. Most of the plants also would not be able to reproduce. Declining pollinator populations in some areas have prompted governments to implement pest management and efficient land-use practices to promote pollinator activity. Today authorities understand the need to protect and restore habitats necessary for the sustenance of pollinator diversity.

Dispersal of Seeds

Ants play a crucial role in the dispersal of fruit and seeds from plants. There are more than 150 species of plants that rely on insects for dispersal. Some plants produce fruit and seeds that are eaten and collected by ants. Seeds that are not consumed germinate along paths used by ants. By utilizing insects such as ants, plants ensure that their seeds are dispersed over long distances without having to rely on wind.

Insect biodiversity on a flower, a butterfly common blue Polyommatus icarus, a bee Anthophila in flight and a shield bug Carpocoris fuscispinus on a yellow Rudbeckia.

Decomposition of Animal and Plant Matter

Insects play a vital role in the decomposition of animal and plant matter, which is essential for the release of nutrients that are later utilized for growing plants. Decomposition also helps in the removal of disease-causing organisms in carcasses. Dung beetles and termites are particularly crucial as they provide agricultural service by removing and assisting in the decomposition of livestock dung, thus limiting the fouling of pasture through the accumulation of excrement. Such services also help in improving water and carbon storage in soil, reduction of livestock loss as a result of blood-feeding flies, and the reduction of nitrogen loss due to volatilization and erosion.

Nutrition

Insects provide nutrition to other animals that include birds and humans. Typical insect feeders among the birds include woodpeckers, warblers, tits, cuckoos, and sparrows. Other wild insect-eating vertebrates are lizards, frogs, toads, mice, salamanders, and bats. Over 3,000 ethnic groups eat 2,086 species of insects across 130 countries. Insects are, therefore, an essential source of nutrition to many people around the world. Insect consumption is also increasingly becoming popular in different parts around the world. Insects also produce protein, which is estimated to be 300

... *continued on page 9*

HEALING

What Are Social Insects?

BY DEBBIE HADLEY | *ThoughtCo* | February 19, 2020

The true social insects — all ants and termites, and some bees and wasps — comprise 75 percent of the world's insect biomass, according to E.O. Wilson. A colony of social bees can number in the tens of thousands, and hundreds of millions of ants can live together in a supercolony of interconnected nests.

So what makes social insects behave the way they do? There are several theories, as well as varying degrees of social behavior.

Advantages of Social Behavior in Insects

Why have some insects evolved to live in large, cooperative colonies? There's strength in numbers. Social insects gain several advantages over their solitary cousins. Social insects work together to find food and other resources and to communicate their findings to others in the community. They can mount a vigorous defense of their home and resources when under attack.

Social insects also can outcompete other insects, and even larger animals, for territory and food. They can quickly construct a shelter, and expand it as needed, and they can divide chores in a manner that ensures everything gets done expeditiously.

Characteristics of Social Insects

So how do we define social, when speaking of insects? Many insects exhibit social behaviors, such as aggregating in large numbers at times. Gregarious behavior does not, by itself, mean an insect is social.

Entomologists refer to true social insects as eusocial. By definition, eusocial insects must exhibit all 3 of these characteristics:

- overlapping generations
- cooperative brood care
- a sterile worker caste

To give an example, think of termites. All termites are eusocial insects. Within a single termite colony, you will find individuals at various stages of the termite life cycle. Generations of termites overlap, and there is a constant supply of new adults prepared to assume responsibility for the colony's care. The community cares for its young cooperatively.

Termite communities are divided into three castes. The reproductive caste is comprised of a king and queen. The soldier caste of both males and females is specially adapted for defending the colony. Soldiers are larger than other termites and are sterile. Finally, the worker caste consists of immature males and females that do all chores: feeding, cleaning, construction, and brood care.

Solitary insects, by contrast, don't exhibit any of these social behaviors.

Degrees of Sociality in Insects

As you may realize by now, many insects don't fit in either category. Some insects are neither eusocial nor solitary. Insects fall somewhere on a spectrum of sociality, with several degrees between solitary and eusocial.

Subsocial Insects

Just a step above solitary insects are the subsocial insects. Subsocial insects provide limited parental care to their offspring. They may shelter or guard their eggs, or even stay with their young nymphs or larvae for a time.

Most subsocial insects don't use nests to shelter their young, though there are exceptions to this rule. Giant water bugs fall into the subsocial group. The female deposits her eggs on the male›s back, and he is charged with protecting and caring for the offspring until they hatch.

Communal Insects

Communal insects share a nest site with others of the same generation. This social behavior may be exhibited in one particular stage of the life cycle, such as in the larval stage of some moths. Communal insects use sophisticated forms of communication and gain certain advantages from nesting together. Communal living may help them avoid predation, assist them with thermoregulation, or enable them to find and use resources more efficiently.

Communal insects never share in caring for offspring, however. Tent-making caterpillars, such as the eastern tent caterpillars, build a communal silk tent, in which they all shelter. They share information about food sources by creating chemical trails, allowing their siblings to follow the scent to its location.

Quasi-social Insects

A slightly more advanced form of social behavior is exhibited by quasi-social insects. These insects do exhibit cooperative care of their young. A single generation shares a common nest. Certain orchard

"Despite its dark veins, the transparency of dragonfly's wings assures me of a pure innocent world."

MUNIA KHAN // Indian-English Writer

bees function as quasi-social groups, with multiple females sharing a nest and caring for their young together. Though all the bees share in brood care, not all bees lay eggs in the nest cells.

Semi-social Insects

Semi-social insects also share child-rearing duties with other individuals of the same generation, in a common nest.

As in true social insects, some members of the group are nonreproductive workers. However, this generation will leave their nest before the next generation emerges. The new adults will disperse and construct new nests for their offspring. For example, paper wasps are semi-social in the spring, with nonreproductive workers helping expand the nest and tend to the brood in a new colony.

Primitively Eusocial Insects

The sole difference between eusocial insects and primitively eusocial insects lies in the sterile worker caste. In primitively eusocial insects, the workers look the same as queens, with little or no morphological differences between the castes. Some sweat bees are primitively eusocial.

Bumblebees, for example, are also considered primitively eusocial, although they're an unusual example in that the queen is slightly larger than her workers, and therefore can be differentiated. ●

... *continued from page 7*

times more efficient than cattle. Replacing proteins produced by vertebrates with insect protein is likely to reduce greenhouse gas emissions significantly while also saving grain required for feed production. Some experts predict that insect protein could be an essential food for the future.

Insects as solutions to Global Challenges

Scientists think that insects are solutions to several environmental issues facing the world today. Insects can be used as part of comprehensive solutions to global challenges, including the provision of sustainable fuel, food production, and mitigating environmental degradation.

Conserving and Managing Insects in the Ecosystem

The management of insects, the ecosystem, and their interactions in a sustainable way is crucial for the survival of all organisms. Unfortunately, most people, especially those in urban environments, often lack appreciation for the significance of insects in the ecosystem that we depend on. Dependence on insects and the services they provide only becomes apparent when delivery is threatened. Scientists believe that over 40% of insect species could go extinct in the not so distant future due to habitat loss. Attitudes towards the various taxa influence public support toward the conservation of species. Unfortunately, there exists widespread negativity towards insects, which consequently detracts efforts aimed at conservation..●

RANDOM-NEST

Insects | Physical Characteristics

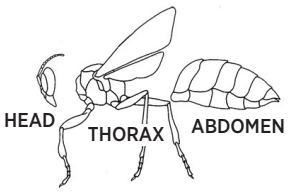
BY FROM SCIENCE LEARNING HUB

Regardless of their size, behaviour, or habitat, insects worldwide have common physical characteristics.

The exoskeleton | Insects have an outer skeleton called an exoskeleton. This hard covering protects and supports the body. It is made up of two layers. Depending on the insect, the exoskeleton can be quite hard and rigid — like that of a cockroach — or less so when the insect is in its larval (caterpillar) stage or if it has a soft body — like a blue blowfly.
The exoskeleton is non-living so it cannot grow with the insect when it is in its larval form or as an adult. Insects shed their old exoskeletons, expand to a larger size and then wait for the new exoskeleton to harden.

The head | The head is the top section of an insect's body. Many of the insect's sense organs are located here. A pair of antennae allow insects to smell, feel the surface of an object, sense hot and cold, listen to sounds or detect movement. Insects have a pair of compound eyes — each made up of thousands of lenses.

The insect's mouthparts are also on the head. Insects such as beetles and grasshoppers have mouthparts that allow them to chew.



The thorax | The thorax is an insect's middle section. It consists of three segments. Each segment has a pair of jointed legs. An insect's legs are adapted to suit their lifestyle and habitat. They include:

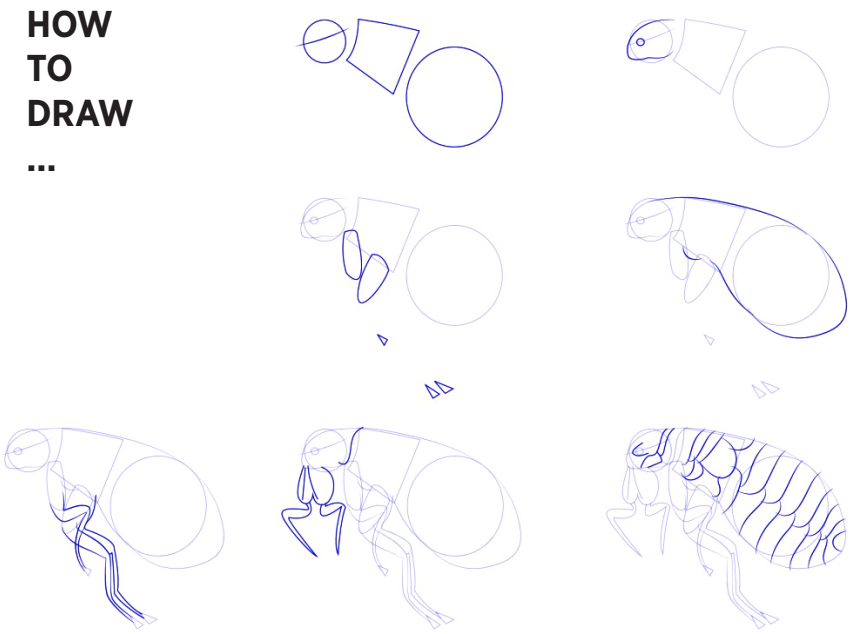
- long narrow legs made for running and fast movement (beetles and cockroaches)
- muscular hind legs made for jumping (grasshoppers and fleas)
- hunting forelegs made for grabbing and holding prey (praying mantises)
- swimming legs made for easy movement through water (water boatmen)
- broad, flat forelegs made for digging burrows (mole crickets).

If the insect has wings, a pair of forewings and a pair of hind wings are attached to the thorax.

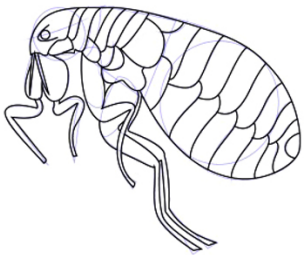
The abdomen | The abdomen is the rear or final section of the insect. This is where the digestive, excretory and reproductive organs are located. The abdomen has 9–11 segments. Each segment has a pair of spiracles or openings in the exoskeleton. Insects open the spiracles to allow air in but close them to prevent water loss. Aquatic insects have similar methods to prevent water from entering the spiracles.

Illustration source: extension.entm.purdue.edu

HOW TO DRAW ...



GREAT! YOU DID IT .... A FLEA!



drawingtutorials101.com

Words of Encouragement

Insects are often viewed by society in varying ways. For some people, they are a pest or irritation and for others, they are a thing of beauty and meant to be cherished. They have flourished in some communities and been destroyed by others. No matter how you view or perceive these bugs, we hope this issue of *The Warbler* supplied you with a different perspective of these tiny creatures. Maybe a way to broaden our awareness of how something so small and sometimes so annoying can be so important and vital to our very existence.

If you have an idea or suggestion for our team, feel free to write to us at the address provided below. We would love to hear more from you and value your feedback. Have an amazing week!

Tammy | Editor of *The Warbler*

Send ideas and comments to:

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“I don’t do bugs.”

SIMONE BILES // American Olympic gymnast

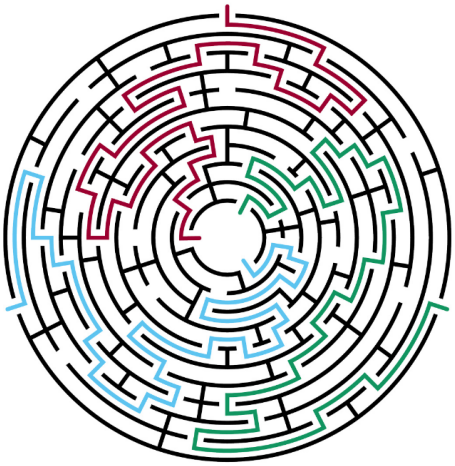
Answers

SUDOKU #221

7	3	4	8	5	9	1	2	6
9	1	2	7	6	3	4	5	8
5	8	6	4	1	2	7	3	9
2	4	1	3	7	8	6	9	5
6	5	8	2	9	1	3	4	7
3	9	7	5	4	6	8	1	2
1	2	9	6	8	4	5	7	3
8	7	3	1	2	5	9	6	4
4	6	5	9	3	7	2	8	1

SUDOKU #222

2	1	3	7	4	5	9	6	8
8	5	9	6	2	3	7	1	4
7	4	6	8	1	9	3	5	2
9	3	7	5	8	2	1	4	6
5	6	8	4	9	1	2	3	7
1	2	4	3	6	7	5	8	9
3	8	2	1	7	6	4	9	5
6	9	1	2	5	4	8	7	3
4	7	5	9	3	8	6	2	1



Rebus Puzzle // Page 5

1. No end in sight
2. Batter up
3. Lower back pain

UNTIL NEXT TIME !